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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,147	06/07/2006	Yoshihiro Akechi	JFE-06-1122	8833

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EXAMINER	
LEE, LESLIE A	
ART UNIT	PAPER NUMBER
3657	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,147	AKECHI ET AL.	
	Examiner	Art Unit	
	LESLIE A. LEE	4184	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *35-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The Amendment filed March 3, 2004 has been entered. Claims 35-40 remain pending in the application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beninga (USPN 6,341,619), and further in view of Forster et al. (US PGPub 2004/0225598).

Beninga teaches: A sensor comprising a T-shaped member (10, fig 2) having a lubricant passage (1, fig 2) connected to the lubricant feed pipe and a detector insertion portion having a passageway and extending substantially vertically from a middle portion of the lubricant passage (13, fig 2), into which passageway a detector (2, fig 2) is inserted.

Beninga does not teach: A lubricant-feed-state monitoring sensor disposed directly associated with that monitors the feed state of lubricant by detecting the supply of lubricant to a device fed with oily or fatty lubricant or a lubricant feed pipe that feeds lubricant to the device, wherein the detector is disposed such that a first end portion of the detector is fixed to a top portion of the detector insertion portion, a middle portion extends along the passageway and a second end portion is positioned in the lubricant passage without restraint, the detector undergoing bending deflection by displacement of the second end portion due to the flow of

the lubricant, and the detector having a piezoelectric element that generates voltage by the bending deflection.

Forster et al. teaches a sensor (18, fig 2c) with an orifice (20, fic 2c) through which fluid (any liquid, paragraph 5) flow passes through, and a paddle structure (22, fig 2c) which is fixed and extends through the passageway and contains a piezo-resistive Wheatsone bridge (24, fig 2c) that generates voltage by bending deflection caused by fluid flow. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the sensor of Forster et al. to the fluid meter of Beninga and to a lubrication feed pipe because Forster et al. states that this flow sensor reduces space requirements, external tubing, connectors fittings, and cost of installation and maintenance (paragraph 81).

3. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beninga (USPN 6,341,619) as modified by Forster et al. (US PG Pub 2004/0025598) as applies to claim 35 above, and further in view of Wiktor (USPN 6,232,129).

Beninga as modified by Forster et al. does not teach: wherein the detector further comprises a heat shrinkable film made of a flexible material that coats the piezoelectric element.

Wiktor teaches a heat shrink tubing surrounding a piezoelectric element. It would have been obvious to one of ordinary skill in the art to combine the heat shrink tubing cited in Wiktor with the piezoelectric film of Forster et al. because Wiktor states that the heat shrink tubing provides mechanical protection and electrical insulation for the piezoelectric element (column 5, lines 7-9).

4. Claims 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forster et al. (US PG Pub 2004/0025598), and further in view of Rafei (US PGPub 2004/0255656).

Re claim 37, Forster et al. teaches: A method of monitoring a feed state to a device fed with a sensor (sensor 18, fig 2c) mounted to the device or a feed pipe connected to the device comprising: disposing the sensor to undergo bending deflection by flow ("fluid to be measured is directed through the orifice in the flow sensor", page 3 paragraph 52); converting strain generated by the sensor due to the bending deflection to an electrical signal ("creates a change in voltage", page 3 paragraph 52);

Forster et al. does not teach: measuring peak voltage of the electrical signal by peak hold processing; and when the peak voltage is in a predetermined range, determining that the feed state is abnormal.

Rafei teaches monitor circuit (15, fig 1) which produces an alarm or shut down signal (136, fig 6a) when lubrication conditions based on a flow signal (22, fig 6a) from a flow monitor (20, fig 6a) and other condition signals falls outside acceptable operation parameters.

It would have been obvious to one of ordinary skill in the art to apply the flow sensor cited in Forster et al. to the monitor circuit system cited in Rafei because the flow sensor cited in Forster et al. is an equivalent with the flow monitor cited in Rafei.

Forster et al. does not teach this method applied to a lubrication system.

It would have been obvious to one of ordinary skill in the art to apply the signal processing and alarm method disclosed in Forster et al. to a

lubrication system because the flow sensor cited in Forster et al. is capable of being applied to any type of flow system and Forster et al. states that this flow sensor reduces space requirements, external tubing, connectors fittings, and cost of installation and maintenance (page 5, paragraph 81).

Re claim 38, Forster et al. does not teach: wherein a lower threshold and an upper threshold are set for the peak voltage in advance; and when the peak voltage falls below the lower threshold, determining that the amount of lubricant has decreased or stopped, and when the peak voltage exceeds the upper threshold, determining that the part downstream from the sensor is clogged.

Rafei teaches monitor circuit (15, fig 1) which produces an alarm or shut down signal (136, fig 6a) when lubrication conditions based on a flow signal (22, fig 6a) from a flow monitor (20, fig 6a) and other condition signals falls outside acceptable operation parameters.

It would have been obvious to one of ordinary skill in the art to apply the flow sensor cited in Forster et al. to the monitor circuit system cited in Rafei because the flow sensor cited in Forster et al. is an equivalent with the flow monitor cited in Rafei.

Re claim 39, Forster et al. as modified by Rafei teaches: wherein, when the sensor is a piezoelectric element (piezo-resistive Wheatstone bridge 24, fig 2c of Forster et al.), capacitance of the sensor is measured after monitoring of the lubricant feed state has been started and when the capacitance of the sensor is less than a predetermined threshold, determining that the sensor is abnormal (alarm signal 136, fig 6a of Rafei).

Forster et al. as modified by Rafei does not teach: and abnormality due to the abnormal sensor is removed from the determination on abnormality of feed state of lubricant based on the peak voltage, on the basis of the determination on the sensor abnormality.

It would have been obvious to one of ordinary skill in the art to remove the abnormality due to the alarm signal cited in Rafei because it is inherent in the purpose of an alarm to address or remove the cause of the alarm.

Re claim 40, Forster et al. as modified by Rafei teaches: wherein, when the sensor is a piezoelectric element (piezo-resistive Wheatstone bridge 24, fig 2c of Forster et al.), capacitance of the sensor is measured after monitoring of the lubricant feed state has been started and when the capacitance of the sensor is less than a predetermined threshold, determining that the sensor is abnormal (alarm signal 136, fig 6a of Rafei).

Forster et al. as modified by Rafei does not teach: and abnormality due to the abnormal sensor is removed from the determination on abnormality of feed state of lubricant based on the peak voltage, on the basis of the determination on the sensor abnormality.

It would have been obvious to one of ordinary skill in the art to remove the abnormality due to the alarm signal cited in Forster et al. because it is inherent in the purpose of an alarm to address or remove the cause of the alarm.

Response to Arguments

5. Applicant's arguments with respect to claims 35 and 36 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments filed January 8, 2009 have been fully considered but they are not persuasive.

Applicant argues on pages 7-9 of the remarks that the voltage signals measured by Rafei teach away from the claimed subject matter and are intended to remain substantially constant and only instigated an alarm signal when there is a deviation from the constant voltage, and that this is different from the Applicant's step of measuring peak voltage. Rafei teaches a constant measurement of various lubricant voltage signals. Therefore, the deviation from a substantially constant voltage is a measurement of peak voltage, and is a deviation from a range of voltage. As such, the determination that the feed state is abnormal is made off of a deviation of a peak voltage from a predetermined range. Consequently, it would have been obvious to one of ordinary skill in the art to determine that the feed state is abnormal based on a peak voltage.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LESLIE A. LEE whose telephone number is (571)270-5927. The examiner can normally be reached on Monday - Thursday 9:00 - 6:30, Friday 9:00-5:00, with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571)272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. A. L./
Examiner, Art Unit 4184

/Robert A. Siconolfi/
Supervisory Patent Examiner, Art Unit 3657

February 13, 2009